

Selected Patents, Publications, and Presentations
Battery Technology Department
Chemical Engineering Division, Argonne National Laboratory

Patents and Inventions

Overcharge Protection for Electrochemical Cells
K. Amine, J. Liu, K. Jambunathan, B. K. Peterson, and G. Dantsin
EP Patent No. 1,587,158 A2, October 19, 2005

Oxygen Ion Conducting Materials
J. Vaughey, M. Krumpelt, X. Wang, and J. D. Carter
U.S. Patent No. 6,916,570, July 12, 2005

Three-Electrode Metal Oxide Reduction Cell
D. W. Dees and J. P. Ackerman
U.S. Patent 6,911,134, June 28, 2005

Wound Bipolar Lithium Polymer Batteries
K. Amine and P. A. Nelson
U.S. Patent No. 6,858,345, February 22, 2005

Negative Electrodes for Lithium Cells and Batteries
J. T. Vaughey, L. M. L. Fransson, and M. M. Thackeray
U.S. Patent No. 6,855,460, February 15, 2005

Overcharge Protection for Electrochemical Cells
K. Amine, J. Liu, K. Jambunathan, B. K. Peterson, and G. Dantsin
U.S. Patent No. 0,227,143 A1, October 13, 2005

Oxygen Ion Conducting Materials
J. Vaughey, M. Krumpelt, X. Wang, and J. D. Carter
U.S. Patent No. 6,821,498, November 23, 2004

Electrodes for Lithium Batteries
C. S. Johnson, M. M. Thackeray, J.-S. Kim, M. A. Anderson, and W. Zeltner
Patent Application No. 20040191633, September 30, 2004

Oxygen Ion Conducting Materials
J. Vaughey, M. Krumpelt, X. Wang, and J. D. Carter
U.S. Patent No. 6,521,202, February 18, 2003

Intermetallic Negative Electrodes for Non-Aqueous Lithium Cells and Batteries
M. M. Thackeray, J. T. Vaughey, C. S. Johnson, L. M. L. Fransson, E. K. Edstrom, and
G. Henriksen
U.S. Patent 6,730,429, May 4, 2004

Long Life Lithium Batteries with Stabilized Electrodes
J. Kim, K. Amine, and D. R. Vissers
U. S. patent application, filed May 28, 2004 (Disclosure No. ANL-IN-03-047)

Lithium Metal Oxide Electrodes for Lithium Batteries

M. M. Thackeray, J.-S. Kim, and C. S. Johnson

Patent Application No. 20050026040 A1, February 3, 2005

Lithium-Metal-Oxide Electrodes for Lithium Cells and Batteries

M. M. Thackeray, C. S. Johnson, K. Amine, and J. Kim

U. S. Patent No. 6,677,082, January 13, 2004

Lithium-Metal-Oxide Electrodes for Lithium Cells and Batteries

M. M. Thackeray, C. S. Johnson, K. Amine, and J. Kim

U. S. Patent No. 6,680,143, January 20, 2004

Layered Electrodes for Lithium Cells and Batteries

C. S. Johnson, M. M. Thackeray, J. T. Vaughey, A. J. Kahaian, and J.-S. Kim

Patent Application No. 20030180616, September 25, 2003

Anode for Rechargeable Lithium Batteries

M. M. Thackeray, K. D. Kepler, and J. T. Vaughey

U. S. Patent 6,528,208, March 4, 2003

Packaging for Primary and Secondary Batteries

K. Amine, A. Newman, D. Vissers, and A. Jansen

U.S. Patent Application No. 20020164441, November 7, 2002

Journal Articles and Book Chapters

Capacity Fade of $\text{Li}_{1+x}\text{Mn}_{2-x}\text{O}_4$ -Based Lithium-Ion Cells

Z. Chen and K. Amine

Journal of the Electrochemical Society **153**(2), A316-A320 (2006)

Dopant-Induced Stabilization of Rhombohedral LiMnO_2 against Jahn-Teller Distortion

R. Prasad, R. Benedek, and M. M. Thackeray

Phys. Rev. B **134111** (2005)

Network-Type Ionic Conductors Based on Oligoethyleneoxy-Functionalized Pentamethylcyclopentasiloxanes

Z. Zhang, L. J. Lyons, K. Amine, and R. West

Macromolecules **38**, 5714-5720 (2005)

X-Ray Photoelectron Spectroscopy of Negative Electrodes from High-Power Lithium-Ion Cells Showing Various Levels of Power Fade

M. Herstedt, D. P. Abraham, J. B. Kerr, and K. Edström

Electrochimica Acta **49**(28), 5097-5110 (2004)

Application of a Lithium-Tin Reference Electrode to Determine Electrode Contributions to Impedance Rise in High-Power Lithium-Ion Cells

D. P. Abraham, S. D. Poppen, A. N. Jansen, J. Liu, and D. W. Dees

Electrochimica Acta **49**(26), 4763-4775 (2004)

The Significance of the Li_2MnO_3 Component in "Composite" $x\text{Li}_2\text{MnO}_3 \bullet (1-x)\text{LiMn}_{0.5}\text{Ni}_{0.5}\text{O}_2$ Electrodes

C. S. Johnson, J.-S. Kim, C. Lefief, N. Li, J. T. Vaughey, and M. M. Thackeray

Electrochemistry Communications **6**(10), 1085,1091 (2004)

Advanced Cathode Materials for High-Power Applications

K. Amine, J. Liu, I. Belharouak, S.-H. Kang, I. Bloom, D. Vissers, and G. Henriksen
Journal of Power Sources **146**, (1-2) 111-115 (2005)

Batteries, Transportation Applications

M. M. Thackeray
Encyclopedia of Energy **1**, 127-139 (2004)

Batteries, Transportation Applications

M. M. Thackeray
Encyclopedia of Energy, **1**, 127-139 (2004)

Electrochemical and Structural Properties of $x\text{Li}_2\text{M}'\text{O}_3 \bullet (1-x)\text{LiMn}_{0.5}\text{Ni}_{0.5}\text{O}_2$ Electrodes for Lithium Batteries ($\text{M}'=\text{Ti}, \text{Mn}, \text{Zr}; 0 \leq x \leq 0.3$)

J.-S. Kim, C. S. Johnson, J. T. Vaughey, M. M. Thackeray, S. A. Hackney, W. Yoon, and C. P. Grey
Chemistry of Materials **16**(10), 1996-2006

Synthesis and Electrochemical Behavior of Layered $\text{Li}(\text{Ni}_{0.5-x}\text{Co}_{2x}\text{Mn}_{0.5-x})\text{O}_2$ ($x = 0$ and 0.025) Materials Prepared by Solid-State Reaction Method

Y.-K. Sun, S.-H. Kang, and K. Amine
Materials Research Bulletin **39**, 819-825 (2004)

Aluminum-Doped Lithium Nickel Cobalt Oxide Electrodes for High-Power Lithium-Ion Batteries

C. H. Chen, J. Liu, M. E. Stoll, G. L. Henriksen, D. R. Vissers, and K. Amine
Journal of Power Sources **128**(2), 278-285 (2004)

Improved Lithium Manganese Oxide Spinel/Graphite Li-Ion Cells for High-Power Applications

K. Amine, J. Liu, S. Kang, I. Belharouak, Y. Hyung, D. Vissers, and G. Henriksen
Journal of Power Sources **129**(1), 14-19 (2004)

Ion Conductive Characteristics of Cross-Linked Network Polysiloxane-Based Solid Polymer Electrolytes

Z. C. Zhang, J. J. Fin, F. Bautista, L. J. Lyons, N. Shariatzadeh, D. Sherlock, K. Amine, and R. West
Solid State Ionics **170**, 233-238 (2004)

Differential Voltage Analysis of High-Power, Lithium-Ion Cells: 1. Technique and Applications

I. Bloom, A. N. Jansen, D. P. Abraham, J. Knuth, S. A. Jones, V. S. Battaglia, and G. L. Henriksen
Journal of Power Sources **139**(1-2), 295-303 (2005)

The Electrochemical Stability of Spinel Electrodes Coated with ZrO_2 , Al_2O_3 and SiO_2 from Colloidal Suspensions

J.-S. Kim, C. S. Johnson, J. T. Vaughey, S. A. Hackney, K. A. Walz, W. A. Zeltner, M. A. Anderson, and M. M. Thackeray
Journal of the Electrochemical Society **151**(10), A1755-A1761 (2004)

Stable Lithium-Ion Conducting Perovskite Lithium-Strontium-Tantalum-Zirconium-Oxide System

C. H. Chen, S. Xie, E. Sperling, A. S. Yang, G. Henriksen, and K. Amine
Solid State Ionics **167**(3-4), 263-272 (2004)

Reduction Mechanism of Ethylene, Propylene and Vinylethylene Carbonates: A Quantum Chemical Study

J. M. Vollmer, L. A. Curtiss, D. R. Vissers, and K. Amine
Journal of the Electrochemical Society **151**(1), A178-A183 (2004)

Suppressing the Impedance Rise of $\text{LiNi}_{0.8}\text{Co}_{0.2}\text{O}_2$ /Graphite Cells by Al, Ti and Mg Doping

C. H. Chen, S. Xie, J. Liu, and K. Amine

The Chinese Journal of Process Engineering, **4**(1), 59-63 (2004)

Material Characterization and Electrochemical Study on $\text{LiNi}_{0.95}\text{Tl}_{0.05}\text{O}_2$ Materials

J. Kim, J. Liu, C. Chen, and K. Amine

Journal of the Electrochemical Society **150**(11), A1491-A1497 (2003)

The Significance of the Tetrahedral A-Site in the Electrochemical Performance of Substituted $\text{Li}_{1.05}\text{Mn}_{0.05}\text{Mn}_{1.90}\text{O}_4$ Spinel Electrodes (M=Li, Mg, Zn, Al) in Lithium Cells

J.-S. Kim, J. T. Vaughey, C. S. Johnson, and M. M. Thackeray

Journal of the Electrochemical Society **150**(11), A1498-A1502 (2003)

Microscopy and Spectroscopy of Lithium Nickel Oxide Based Particles Used in High-Power Lithium-Ion Cells

D. P. Abraham, R. D. Tweten, M. Balasubramanian, J. Kropf, D. Fischer, J. McBreen, I. Petrov, and K. Amine

Journal of the Electrochemical Society, **150**(11), A1450-1456 (2003)

Effect of Cathode Composition on Capacity Fade, Impedance Rise and Power Fade in High-Power, Lithium-Ion Cells

I. Bloom, S. A. Jones, V. S. Battaglia, G. L. Henriksen, J. P. Christopherson, R. B. Wright, C. D. Ho, J. R. Belt, and C. G. Motloch

Journal of Power Sources **124**(2), 538-550 (2003)

Synthesis and Electrochemical Properties of Layer-Structured $0.5\text{Li}(\text{Ni}_{0.5}\text{Mn}_{0.5})\text{O}_2$ - $0.5\text{Li}(\text{Li}_{1/3}\text{Mn}_{2/3})\text{O}_2$ Solid Mixture

S.-H. Kang and K. Amine

Journal of Power Sources **124**(2), 533-537 (2003)

Electrochemical and *Ex Situ* X-ray Study of $\text{Li}(\text{Li}_{0.2}\text{Ni}_{0.2}\text{Mn}_{0.6})\text{O}_2$ Cathode Material for Li Secondary Batteries

S.-H. Kang, Y. K. Sun, and K. Amine

Electrochemistry and Solid-State Letters **6**(9), A-183-A186 (2003)

ZrO_2 - and Li_2ZrO_3 -Stabilized Spinel and Layered Electrodes for Lithium Batteries

M. M. Thackeray, C. S. Johnson, J.-S. Kim, J. T. Vaughey, N. L. Dietz, D. P. Abraham, S. A. Hackney, W. Zeltner, and M. A. Anderson

Electrochemistry Communications **5**(9), 752-758 (2003)

$\text{Li}(\text{Ni}_{1/3}\text{Co}_{1/3}\text{Mn}_{1/3})\text{O}_2$ as a Suitable Cathode for High Power Application

I. Belharouak, Y.-K. Sun, J. Liu, and K. Amine

Journal of Power Sources **123**(2), 247-252 (2003)

Divalent-Dopant Criterion for the Suppression of Jahn-Teller Distortion in Mn Oxides: First-Principles Calculations and XAS Measurements for Co in LiMnO_2

R. Prasad, R. Benedek, A. J. Kropf, C. S. Johnson, A. D. Robertson, P. G. Bruce, and M. M. Thackeray

Physical Review B **68**(1), 012101 (2003)

Modification of Polymethylhydrosiloxane by Dehydrocoupling Reactions Catalyzed by Transition Metal Complexes: Evidence for the Preservation of Linear Siloxane Structures

R. Zhang, Z. Zhang, K. Amine, and R. West

Silicon Chemistry **2**, 271-277 (2003)

The Electrochemical Behavior of $x\text{LiNiO}_2 \square (1-x)\text{Li}_2\text{RuO}_3$ and $\text{Li}_2\text{Ru}_{1-y}\text{Zr}_y\text{O}_3$ Electrodes in Lithium Cells

G. J. Moore, C. S. Johnson, and M. M. Thackeray

Journal of Power Sources **119-121**, 216-220 (2003)

Diagnosis of Power Fade Mechanisms in High-Power Lithium-Ion Cells

D. P. Abraham, L. Liu, C. H. Chen, Y. E. Hyung, M. Stoll, N. Elsen, S. MacLaren, R. Twesten, R.

Haasch, E. Sammann, I. Petrov, K. Amine, and G. L. Henriksen

Journal of Power Sources **119-121**(1), 511-516 (2003)

$\text{LiNi}_{0.5}\text{Co}_{0.5}\text{O}_2$ as a Long-Lived Positive Active Material for Lithium-Ion Batteries

I. Belharouak, H. Tsukamoto, and K. Amine

Journal of Power Sources, **119-121**, 175-177 (2003)

Structural and Electrochemical Evaluation of $(1-x)\text{Li}_2\text{TiO}_3 \square (x)\text{LiMn}_{0.5}\text{O}_2$ as an Electrode Material for Lithium Batteries

C. S. Johnson, J.-S. Kim, A. J. Kropf, A. J. Kahaian, J. T. Vaughey, and M. M. Thackeray

Journal of Power Sources **119-121**, 139-144 (2003)

Alternative Anode Materials for Lithium-Ion Batteries: A Study of Ag_3Sb

J. T. Vaughey, L. Fransson, K. Edström, H. A. Swinger, C. S. Johnson, and M. M. Thackeray

Journal of Power Sources **119-121**, 64-68 (2003)

Structural Characterization of Layered $\text{Li}_x\text{Ni}_{0.5}\text{O}_2$ ($0 < x \leq 2$) Oxide Electrodes for Li Batteries

C. S. Johnson, J.-S. Kim, A. J. Kropf, A. J. Kahaian, J. T. Vaughey, L. Fransson, K. Edström, M. M. Thackeray

Chemistry of Materials **15**(12), 2313-2322 (2003)

$\text{Li}_2\text{MTi}_6\text{O}_{14}$ (M=Sr, Ba) New Anodes for Lithium Ion Batteries

I. Belharouak and K. Amine

Electrochemistry Communications **5**(6), 435-438 (2003)

Accelerating Rate Calorimetry Study on the Thermal Stability of Interpenetrating Network Type Poly(siloxane-g-ethylene oxide) Polymer

B. Oh, Y.-E. Hyung, D. R. Vissers, and K. Amine

Electrochimica Acta **48**(14-16), 2215-2220 (2003)

New Interpenetrating Network Type Poly(siloxane-g-ethylene oxide) Polymer Electrolyte for Lithium Battery

B. Oh, D. Vissers, Z. Zhang, R. West, H. Tsukamoto, and K. Amine

Journal of Power Sources **119-121**, 442-447 (2003)

Flame-Retardant Additives for Lithium-Ion Batteries

Y.-E. Hyung, D. R. Vissers, and K. Amine

Journal of Power Sources **119-121**, 383-387 (2003)

Nonaqueous Electrolyte for Wide Temperature Range Operation of Li-Ion Cells

T. R. Jow, M. S. Ding, K. Xu, S. S. Zhang, J. L. Allen, K. Amine, and G. L. Henriksen

Journal of Power Sources **119-121**, 343-348 (2003)

Comparative Study of $\text{Li}(\text{Ni}_{0.5-x}\text{Mn}_{0.5-x}\text{M}_{2x})\text{O}_2$ ($\text{M}'=\text{Mg, Al, Co, Ni, Ti}, x=0.0, 0.025$) Cathode Material for Rechargeable Lithium Batteries

S.-H. Kang and K. Amine

Journal of Power Sources **119-121**, 150-155 (2003)

New Interpenetrating Network Type Poly(Siloxane-*g*-Ethylene Oxide) Polymer Electrolyte for Lithium Battery

B. Oh, D. Vissers, Z. Zhang, R. West, H. Tsukamoto, and K. Amine
Journal of Power Sources **119-121**, 442-447 (2003)

Diagnosis of Power Fade Mechanisms in High Power Lithium Ion Cells

D. Abraham, J. Liu, C. Chen, Y. Hyung, M. Stoll, N. Elsen, S. McLaren, R. Twesten, R. Haasch, E. Sammann, I. Petrov, K. Amine and G. Henriksen
Journal of Power Sources, **119-121**, 511-516 (2003)

Effect of Co Doping on the Magnetism and Phase Stability of Lithiated Manganese Oxides

R. Prasad, R. Benedek, and M. M. Thackeray
Bulletin of Materials Science **26**(1), 147-150 (2003)

Structural Transformations in Intermetallic Electrodes for Lithium Batteries: An *In Situ* XRD Study of Lithiated MnSb and Mn₂Sb

L. M. L. Fransson, J. T. Vaughey, K. Edstrom, and M. M. Thackeray
Journal of the Electrochemical Society **150**(1), A86-A91 (2003)

Structural Considerations of Intermetallic Electrodes for Lithium Batteries

M. M. Thackeray, J. T. Vaughey, C. S. Johnson, A. J. Kropf, R. Benedek, L. M. L. Fransson, and K. Edstrom
Journal of Power Sources **113**(1), 124-130 (2003)

New Interpenetrating Network Type Siloxane Polymer Electrolyte

B. Oh, Y.-E. Hyung, D. R. Vissers, and K. Amine
Electrochemical and Solid-State Letters **5**(11), 59-61 (2002)

Synthesis and Electrochemical Properties of Li[Li_{(1-2x)/3}Ni_xMn_{(2-x)/3}]O₂ as Cathode Materials for Lithium Secondary Batteries

S.-S. Shin, Y.-K. Sun, and K. Amine
Journal of Power Sources **112**(2), 634-638 (2002)

Surface Characterization of Electrodes from High Power Lithium-Ion Batteries

A. M. Andersson, D. P. Abraham, R. Haasch, S. McLaren, J. Liu, and K. Amine
Journal of the Electrochemical Society **149**(10), A1358–A1369 (2002)

Layered Li(Ni_{0.5-x}Mn_{0.5-x}M'_{2x})O₂ (M'=Co, Al,Ti; x=0,0.025) Cathode Materials for Li-ion Rechargeable Batteries

S.-H. Kang, J. Kim, M. E. Stoll, D. P. Abraham, Y. K. Sun, and K. Amine
Journal of Power Sources **112**(1), 41-48 (2002)

First-Principles Calculations for Li Insertion into InSb

R. Benedek, J. T. Vaughey, M. M. Thackeray, L. H. Yang, and R. Prasad
J. Power Sources **97-98**, 201-203 (2001)

Reports and Report Sections

Diagnostic Examination of Generation 2 Lithium-Ion Cells and Assessment of Performance Degradation Mechanisms

D. P. Abraham (ed.), D. W. Dees, G. L. Henriksen, J. Knuth, E. Reynolds, R. Gerald, A. Jansen, Y.-E. Hyung, I. Belharouak, M. Stoll et al.
ANL-05/21, Argonne National Laboratory Report, Argonne, IL (July 2005)

X-Ray Absorption Spectroscopy (XAS) Characterization of 5 V Li[Co_xNi_{0.5-x}Mn_{1.5}]O₄ (x=0, 0.1, 0.2, 0.4, and 0.5) Spinel Cathodes for Lithium Batteries

C. S. Johnson, X. Qian, J. T. Vaughey, M. M. Thackeray, and A. J. Kropf

In: Advanced Photon Source Activity Report, ANL-04/16, Argonne National Laboratory, Argonne, IL, December (2004)

Low-Cost Flexible Packaging for High-Power Li-Ion HEV Batteries

A. N. Jansen, K. Amine, and G. L. Henriksen

ANL-04/09, Argonne National Laboratory Report, Argonne, IL (June 2004)

Screening Report on Cell Materials for High-Power Li-Ion HEV Batteries

J. Liu, A. Kahaian, I. Belharouak, S. Kang, S. Oliver, J. Kim, G. Henriksen and K. Amine

ANL-03/16, Argonne National Laboratory Report, Argonne, IL, April 2003

Materials Cost Evaluation Report for High-Power Li-Ion HEV Batteries

G. L. Henriksen, K. Amine, J. Liu, and P. A. Nelson

ANL-03/5, Argonne National Laboratory Report, Argonne, IL, December 2002

Abstracts and Proceedings Papers

Poor Cycling Performance of C-LiFePO₄/Graphite Li-Ion Cells at High Temperature

K. Amine, J. Liu, and I. Belharouak

ECS 208th Meeting of the Electrochemical Society, Los Angeles, CA, October 16-21, 2005 (extended abstract)

XAFS Analysis of Layered Li_xNi_{0.5}Mn_{0.5}O₂ (0 < x ≤ 2) Electrodes for Lithium Batteries

A. J. Kropf, C. S. Johnson, J. T. Vaughey, and M. M. Thackeray

Physica Scripta **T115**, 274-277 (2005) (paper)

New Process of Coating Olivine LiFePO₄ with Monolayer of Carbon Using a Gas-Phase Reaction

K. Amine, I. Belharouak, and C. Johnson

Published in proceedings of Lithium Battery Discussions: Electrode Materials, Arcachon, France, May 22-27, 2005 (extended abstract)

Spinel Lithium Manganese Oxide in LiBOB Electrolyte for High Power Li-ion Battery Application

J. Liu, A. Kahaian, I. Belharouak, D. Vissers, G. Henriksen, T. R. Jow, and K. Amine

Published in the proceedings of the Electrochemical Society, 204th Meeting of the Electrochemical Society, p.118, 2005 (paper)

Layered Oxide Li_{1+x}(Ni_{1/3}Co_{1/3}Mn_{1/3})O₂ as Cathode for High Energy and High Power Li-Ion Batteries

J. Liu, I. Belharouak, and K. Amine

Published in Proceedings of 206th Meeting of the Electrochemical Society, Honolulu, Hawaii, October 3-8, 2004 (paper)

Spinel Lithium Manganese Oxide in LiBOB Electrolyte for High-Power Li-Ion Battery Applications

J. Liu, A. Kahaian, I. Belharouak, D. Vissers, G. Henriksen, T. R. Jow, and K. Amine

204th Meeting of the Electrochemical Society, Orlando, FL, October 12-17, 2004 (abstract)

Fuel Cell Testing at Argonne National Laboratory

E. Polzin and I. Bloom

In: Abstracts of the Fuel Cell Seminar and Exposition, 2004 Fuel Cell Seminar, San Antonio, TX, November 1-5, 2004, Abstract No. 547 (CD) (extended abstract)

Advanced Cathode Materials for High-Power Applications

K. Amine, I. Belharouak, J. Liu, S.-H. Kang, A. Kahaian, D. Vissers, and G. Henriksen
International Meeting on Lithium Batteries (IMLB-12), Nara, Japan, June 27-July 2, 2004,
No. 51 (abstract)

The Effect of Additives on the Thermal Stability of Lithium-Ion Cells

E. Roth, D. Doughty, K. Amine, and G. Henriksen
International Meeting on Lithium Batteries (IMLB-12), Nara, Japan, June 27-July 2, 2004,
No. 55 (abstract)

Advanced Cathode Materials for High Power Applications

K. Amine, I. Belharouak, J. Liu, S.-H. Kang, A. Kahaian, D. Vissers, and G. Henriksen
Extended Abstract, Published in the Proceedings of the 12th International Meeting on
Lithium Batteries, Nara, Japan, June 27-July 2, 2004 (extended abstract)

Solubility and Stabilization of LiMn₂O₄ Spinel Electrodes in Lithium Batteries

J.-S. Kim, J. T. Vaughey, C. S. Johnson, and M. M. Thackeray
Extended Abstract, to be presented at 204th Meeting of the Electrochemical Society,
Orlando, FL, October 12-17, 2003

High Power Lithium Ion Batteries with Improved Calendar Life and Safety

K. Amine, J. Liu, Y. Hyung, I. Belharouak, and G. L. Henriksen
Extended Abstracts, 43rd Battery Symposium in Japan, Fukuoka, Japan, October 12-14,
p. 2 (2003) (extended abstract)

Overview of Performance Testing of the Advanced Technology Development Program Gen 2 Cells

T. Murphy, C. Motloch, J. Christophersen, R. Wright, K. Gering, C. Ho, I. Bloom, S. Jones, G.
Henriksen, V. Battaglia, T. Duong, and J. Barnes
Proceedings of the 204th Meeting of the Electrochemical Society, Orlando, FL, October
12-17, 2003, No. 233 (paper)

Battery-Level Material Cost Model Facilitates High-Power Li-Ion Battery Cost Reductions

G. Henriksen, K. Amine, J. Liu, and P. Nelson
Proceedings of the 204th Meeting of the Electrochemical Society, Orlando, FL, October
12-17, 2003, No. 255 (paper)

Effect of Additives and Anode Carbon on Heat and Gas Generation in Li-Ion Cells

E. Roth, D. Doughty, K. Amine, and G. Henriksen
Proceedings of the 204th Meeting of the Electrochemical Society, Orlando, FL, October
12-27, 2003, No. 242 (paper)

Froms Gems to Lithium Battery Materials

M. M. Thackeray
Abstract, to be presented at The 21st Meeting of the European Crystallographic
Association, ECM-21, Durban, South Africa, August 24-29, 2003

Improved LiFePO₄ Cathode for Lithium Ion Batteries

I. Belharouak, J. Dodd, H. Tsukamoto, and K. Amine
Extended Abstracts, 14th International Conference on Solid State Ionics, Monterey, CA,
June 22-27, p. 90 (2003)

Modeling the Performance of Lithium-Ion Batteries for Fuel Cell Vehicles

P. Nelson, D. Dees, K. Amine, and G. Henriksen

Paper Number 2003-01-2285 in SP-1789, Hybrid Vehicle and Energy Storage Technologies, Papers from the International Future Transportation Technology Conference, Society of Automotive Engineers, Costa Mesa, CA, June 23-25, 2003 (paper)

Cation Substitution Strategies for 5 V $\text{LiNi}_{0.5}\text{Mn}_{1.5}\text{O}_4$ Spinel Electrodes in Lithium Batteries

X. Qian and C. S. Johnson

Extended Abstracts, Presented at 203rd Electrochemical Society Meeting, Paris, France, April 28-May 2, 2003

Independent, Standardized Fuel Cell Testing: The Fuel Cell Testing Facilities at Argonne National Laboratory

I. Bloom, E. G. Polzin, and W. M. Swift

Presented at the 2002 Fuel Cell Seminar, Palm Springs, CA, November 18-21, 2002, Book of Abstracts, Vol. 1 p. 703 (2002) (abstract)

Modeling Performance of Lithium-Ion Batteries with Manganese Spinel Positive Electrodes

P. A. Nelson, J. Liu, K. Amine, and G. L. Henriksen

Extended Abstracts, 202nd Meeting of the Electrochemical Society, Salt Lake City, UT, October 20–24, 2002, p. 222 (2002) (extended abstract)

Interface Formed on Graphite in LiBOB Based Electrolytes and Its Impacts on Behavior of Li-ion Cells

T. R. Jow, M. S. Ding, K. Xu, S. S. Zhang, J. L. Allen, J. Liu and K. Amine

Abstracts, Lithium Battery Discussion: Electrode Materials, Bordeaux-Arcachon, France, September 14-19, 2003 (extended abstract)

Papers Presented at Scientific Meetings

Advanced Electrolyte Salts with Inherent Overcharge Protection for Lithium Ion Batteries

G. Dantsin, K. Jambunathan, S. V. Ivanov, W. J. Castell, K. Amine, J. Liu, A. N. Jansen, and Z. Chen

Presented at the 208th ECS Meeting, Los Angeles, CA, October 16-21, 2005 (slide presentation)

Poor Cycling Performance of C-LiFePO₄/Graphite Li-Ion Cells at High Temperature

K. Amine, J. Liu and I. Belharouak

Presented at the 208th Meeting of the Electrochemical Society, Los Angeles, CA, October 16-21, 2005 (slide presentation)

Effect of Excess Lithium on Power and Cyclability of $\text{Li}(\text{Ni}_{1/3}\text{Co}_{1/3}\text{Mn}_{1/3})\text{O}_2$

J. Liu, I. Belharouak, and K. Amine

Presented at the 208th Meeting of the Electrochemical Society, Los Angeles, CA, October 16-21, 2005 (slide presentation)

New Process of Coating LiFePO₄ Olivine with Carbon Using a Gas-Phase Reaction

K. Amine, I. Belharouak, J. Liu, and C. Johnson

Presented at Uppsala University Lithium Battery Discussions: Electrode Materials, Arcachon, France, May 22-27, 2005 (poster session)

Effect of Excess Lithium on Power and Cycleability of $\text{Li}_{1+x}(\text{Ni}_{1/3}\text{Co}_{1/3}\text{Mn}_{1/3})\text{O}_{2+y}$

J. Liu, I. Belharouak, and K. Amine

Published in Proceedings of 208th Meeting of the Electrochemical Society, Los Angeles, CA, October 16-21, 2005 (extended abstract)

Batteries for Hybrid Electric Vehicles: Structural Design of Electrode Materials

M. M. Thackeray

Invited Public Lecture, Innovation Hub, Pretoria, South Africa, April 4, 2005 (slide presentation)

DOE Hydrogen Program Fuel Cell Technology

N. Garland and I. Bloom

Presented at Fuel Cell Testing Network International Cooperation Workshop, Madrid, Spain, March 3-4, 2005 (slide presentation)

Aging Characteristics of High-Power Lithium-Ion Cells

I. Bloom, B. Potter, K. L. Gering, J. Christophersen, and G. Henriksen

Presented at 229th American Chemical Society Meeting, San Diego, CA, March 13-15, 2005 (slide presentation)

New Process of Coating LiFePO₄ Olivine with Carbon Using a Gas Phase Reaction

K. Amine, I. Belharouak, J. Liu, and C. Johnson

Presented at Uppsala University Lithium Battery Discussions: Electrode Materials, Aracachon, France, May 22-27, 2005 (poster session)

Fuel Cell Test Facilities at Argonne National Laboratory

I. Bloom, E. G. Polzin, and J. F. Miller

Presented at 2004 Fuel Cell Seminar, San Antonio, TX, November 1-5, 2004 (poster session)

Determining Factors That Affect the Aging Behavior of High-Power Lithium-Ion Cells

D. Abraham, Y. Hyung, A. Jansen, I. Bloom, D. Dees and G. Henriksen

Battery Technology Symposium, Daejon, South Korea, November 11, 2004 (invited) (slide presentation)

Advanced Power Sources for Emergency Telecommunications Applications

I. Bloom

Emergency Power Conference, Washington, DC, November 22, 2004 (slide presentation)

Determining Factors That Affect the Aging Behavior of High-Power Lithium-Ion Cells

D. P. Abraham, Y. E. Hyung, A. Jansen, I. Bloom, D. Dees, and G. Henriksen

Presented at Chonnam University, Gwangju, South Korea, November 12, 2004 (invited) (slide presentation)

Battery Research at Argonne National Laboratory

D. P. Abraham

Presented to Samsung SDI Research, Seoul, South Korea, November 15, 2004 (invited) (slide presentation)

Layered Oxide Material Li(Ni_{1/3}Co_{1/3}Mn_{1/3})O₂ as Cathode for High-Energy, High-Power Lithium-Ion Batteries

J. Liu, I. Belharouak, K. Amine, X. Q. Pan, and H. P. Sun

Presented at 206th Meeting of the Electrochemical Society, Honolulu, HI, October 3-8, 2004 (slide presentation)

Lead and LBE Corrosion Studies at Argonne National Laboratory

D. Abraham, L. Barnes, L. Leibowitz, V. Maroni, S. McDeavitt, J. Runge, and M. Williamson

Presented at Gen IV Materials Crosscut Meeting, Oak Ridge, TN, October 5-6, 2004 (slide presentation)

Experience in the US: DOE Hydrogen Program Fuel Cell Technology

N. Garland and I. Bloom

Presented at Applications and Experiences with Fuel Cells, Mol, Belgium, October 25, 2004 (slide presentation)

Fuel Cell Testing at ANL: Activities and Procedures

I. Bloom, E. Polzin, and J. Miller

FCTESTNET International Cooperation Workshop, Ulm, Germany, October 22, 2004 (slide presentation)

Gen 2 Cell Diagnostics

D. P. Abraham

Presented at Advanced Technology Development Quarterly Review, Washington, DC, October 20, 2004 (slide presentation)

Battery Research at Argonne National Laboratory

D. P. Abraham

Presented to Korea Electrotechnology Research Institute (KERI), Changwon, South Korea, November 10, 2005 (invited) (slide presentation)

Update on the Diagnostic Analysis of Lithium-Ion Cells

D. P. Abraham

Presented at Center for Microanalysis of Materials, University of Illinois at Urbana-Champaign, Champaign, IL, October 24, 2003 (slide presentation)

Studying Electrode Contributions to Impedance Rise with Lithium-Tin Reference Electrodes

D. P. Abraham, S. Poppen, J. Knuth, A. Jansen, and D. Dees

Presented at International Meeting on Lithium Batteries IMLB-12, Nara, Japan, June 27-July 2, 2004 (poster session)

Dopant-Induced Stabilization of Rhombohedral LiMnO₂ against Jahn-Teller Distortion

R. Benedek, R. Prasad, C. S. Johnson, A. J. Kropf, and M. Thackeray

Presented at 12th International Meeting on Lithium Batteries, Nara, Japan, June 27-July 2, 2004 (poster session)

Identifying Factors Responsible for Capacity and Power Loss in Lithium-Ion Cells

D. P. Abraham

Presented at American Vacuum Society Meeting, Baltimore, MD, November 6, 2003 (slide presentation)

Fade Mechanisms in High-Power Lithium-Ion Cells for Transportation Applications

D. P. Abraham, D. W. Dees, E. Sammann, R. Haasch, and R. Tweten

Presented at 204th Meeting of the Electrochemical Society, Orlando, FL, October 12-17, 2003 (extended abstract)

Advanced Cathode Materials for High-Power Applications

K. Amine, I. Belharouak, J. Liu, A. J. Kahaian, D. R. Vissers, and G. L. Henriksen

Abs. 419, 204th Meeting of the Electrochemical Society, Orlando, FL, October 12-17, 2003 (extended abstract)

EIS of ATD Gen 2 Lithium-Ion Cells

I. Bloom, S. A. Jones, G. L. Henriksen, V. S. Battaglia, C. Motloch, J. Christophersen, J. Belt, C. D. Ho, and R. B. Wright

Extended Abstract, to be presented at 204th Meeting of the Electrochemical Society, Orlando, FL, October 12-17, 2003 (extended abstract)

Implications of dV/dQ for the Analysis of Performance Fade in Lithium-Ion Batteries

I. Bloom, S. A. Jones, G. L. Henriksen, V. S. Battaglia, C. Motloch, J. Christophersen, J. Belt, C. D. Ho, and R. B. Wright

204th Meeting of the Electrochemical Society, Orlando, FL, October 12-17, 2003 (paper)

Battery-Level Material Cost Model Facilitates High-Power Li-Ion Battery Cost Reductions

G. L. Henriksen, K. Amine, J. Liu, and P. A. Nelson

Extended Abstract, presented at 204th Meeting of the Electrochemical Society, Orlando, FL, October 12-17, 2003 (extended abstract)

Flexible Low-Cost Packaging for Lithium Ion Batteries

A. N. Jansen, K. Amine, D. J. Chaiko, and G. L. Henriksen

204th Meeting of the Electrochemical Society, Orlando, FL, October 12-17, 2003
(extended abstract)

Identifying Fade Mechanisms in High-Power Lithium-Ion Cells

D. P. Abraham, J. Knuth, D. W. Dees, A. N. Jansen, E. Sammann, R. Haasch, R. D. Tweston, and S. MacLaren

Presented at 204th Meeting of the Electrochemical Society, Orlando, FL, October 12-17, 2003 (paper)

Implications of QdV/dQ for the Analysis of Lithium-Ion Batteries

I. Bloom, S. A. Jones, A. N. Jansen, D. P. Abraham, G. L. Henriksen, V. S. Battaglia, C. Motloch, J. Christophersen, C. D. Ho, and R. B. Wright

Presented at 204th Meeting of the Electrochemical Society, Orlando, FL, October 12-17, 2003 (slide presentation)

EIS of ATD Gen 2 Lithium-Ion Cells

I. Bloom, S. A. Jones, G. L. Henriksen, V. S. Battaglia, C. Motloch, J. Christophersen, J. Belt, C. D. Ho, and R. B. Wright

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204th Meeting of the Electrochemical Society, Orlando, FL, October 12-17, 2003
(extended abstract)

Gen 2 Cell Diagnostics

D. P. Abraham

Presented at Advanced Technology Development Program Quarterly Review, Albuquerque, NM, October 2003 (slide presentation)

Stabilized Spinels and Layered Electrodes for Lithium-Ion Cells

C. S. Johnson, J. S. Kim, J. T. Vaughney, D. P. Abraham, N. Dietz, W. Zeltner, M. A. Anderson, and M. M. Thackeray

Presented at Lithium Ion Battery Discussions, Aracachon, France, September 14-19, 2003 (slide presentation)

Investigation of Corrosion Products on an Air-Oxidized ZrFe₂-Type Intermetallic

D. P. Abraham

Presented at Microscopy and Microanalysis 2003, San Antonio, TX, August 3-7, 2003
(poster session)

Modeling the Performance of Lithium-Ion Batteries for Fuel Cell Vehicles

P. Nelson, D. Dees, K. Amine, and G. Henriksen

Presented at International Future Transportation Technology Conference, Society of Automotive Engineers, Costa Mesa, CA, June 23-25, 2003 (slide presentation)

$\text{Ln}_{1-x}\text{Sr}_x\text{CoO}_3$ ($\text{Ln}=\text{Gd}, \text{Pr}$) as a Cathode for Intermediate-Temperature Solid Oxide Fuel Cells

C. Rossignol, J. M. Ralph, J.-M. Bae and J. T. Vaughey

Presented at 14th International Conference on Solid State Ionics, Monterey, CA, June 22-27, 2003 (paper)

Advanced Cathode Material for High Power Applications

K. Amine and J. Liu

Presented at 1st International Conference on Polymer Batteries and Fuel Cells, Jeju, Korea, June 1-6, 2003

Improved LiFePO₄ Cathode for Lithium Ion Batteries

I. Belharouak, J. Dodd, H. Tsukamoto, and K. Amine

Presented at 14th International Conference on Solid State Ionics, Monterey, CA, June 22-27, 2003

Developing Diagnostic Tools to Determine Fade Mechanisms in Lithium-Ion Cells

D. P. Abraham

Presented at Advanced Technology Development Program Annual Review, Argonne, IL, June 24, 2003 (slide presentation)

Cation Substitution Strategies for 5-V $\text{LiNi}_{0.5}\text{Mn}_{1.5}\text{O}_4$

X. Qian and C. S. Johnson

Paper, submitted for publication in Proceedings of the Electrochemical Society, 203rd Meeting, Paris France, April 28-May 2, 2003

The Role of A-Site Deficiency in the Performance of Sr-Doped Lanthanum Ferrite Cathodes for SOFCs

J. M. Ralph, C. Rossignol, and J. T. Vaughey

To be presented at the 105th Annual Meeting & Exposition of the Am. Ceram. Soc., Nashville, TN, April 27-30, 2003

The Role of A-Site Deficiency in the Performance of Sr-Doped Lanthanum Ferrite Cathodes for SOFCs

J. M. Ralph, C. Rossignol, and J. T. Vaughey

Presented at the American Ceramic Society Annual Meeting, Nashville, TN, April 27-30, 2003

In-Situ, Real-Time XAFS Characterization of Noble Metal Catalysts Impregnation

J. Liu, X. Hao, J. T. Miller, A. J. Kropf, and J. R. Regalbuto

Poster, presented at 12th Users' Meeting for the Advanced Photon Source, Argonne, IL, April 29-May 1, 2003

XAFS Analysis of Layered $\text{Li}_x\text{Ni}_{0.5}\text{Mn}_{0.5}\text{O}_2$ ($0 < x \leq 2$) Electrodes for Lithium Batteries

A. J. Kropf, C. S. Johnson, J. T. Vaughey, and M. M. Thackeray

12th Users' Meeting for the Advanced Photon Source, Argonne, IL, April 29-May 1, 2003 (poster session)

An In-Situ, Real-Time XANES and EXAFS Characterization of Noble Metal Catalyst Impregnation

J. Liu, X. Hao, J. T. Miller, A. J. Kropf, and J. R. Regalbuto

Presented at 12th Users' Meeting for the Advanced Photon Source, Argonne, IL, April 29, May 1, 2003

Enhanced Electrochemical Stability of Colloidal Metal Oxide Coated Spinel LiMn_2O_4 Electrodes

C. S. Johnson, K. Lauze, D. P. Abraham, N. L. Dietz, and M. M. Thackeray

203rd Electrochemical Society Meeting, Paris, France, April 28-May 2, 2003 (extended abstract)

LiFePO_4 as Cathode Material for Rechargeable Lithium-Ion Batteries

L. Agyarko, I. Belharouak, and K. Amine

Presented at the 30th Annual Conference of the Organization for the Professional Advancement of Black Chemists and Chemical Engineers, Indianapolis, IN, April 13-19, 2003 (poster session)

Electroactive Poly-Dilithium Phthalocyanine Coatings for Lithium Battery Materials

N. P. Fackler and C. S. Johnson

Presented at 203rd Electrochemical Society Meeting, Paris France, April 28-May 2, 2003

Cation Substitution Strategies for 5-V $\text{LiNi}_{0.5}\text{Mn}_{1.5}\text{O}_4$ Spinel

X. Qian and C. S. Johnson

Paper, submitted to the Proceedings of the Electrochemical Society, N1 Symposium on "New Trends in Intercalation Compounds for Energy Storage," K. Zaghib and C. Julien, Editors, 203rd Meeting, Paris, France, April 28-May 2, 2003

Formation of Solid Electrolyte Interface on Cycled Lithium-Ion Battery Cathodes

M. Balasubramanian, J. McBreen, X. Q. Yang, H. S. Lee, A. Moodenbaugh, D. A. Fischer, Z. Fu, and D. P. Abraham

Presented at 203rd Electrochemical Society Meeting, Paris, France, April 27-May 2, 2003 (slide presentation)

Performance Changes in Li-Ion Cells

I. Bloom, B. G. Potter, S. A. Jones, C. Motloch, J. Belt, J. Christophersen, and G. L. Henriksen

Presented at the University of South Carolina, Columbia, South Carolina, February 10, 2003 (slide presentation)